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TABLE 3-26.
Values for Daily Intake Calculations
Beach Sediment Exposures

Exposure Route	Daily Intake Equation (mg/kg-day)	Parameter Code	Parameter Definition	Units	Dockside Worker RME Value	Source	Dockside Worker CT Value	Source	Transient RME Value	Source	Transient CT Value	Source	Adult Recreational Beach User RME Value	Source	Adult Recreational Beach User CT Value	Source	Child Recreational Beach User RME Value	Source	Child Recreational Beach User CT Value	Source	Tribal Fisher RME Value	Source	Tribal Fisher CT Value	Source	Fisher High frequency RME Value	Source	Fisher High frequency CT Value	Source	Fisher Low frequency RME Value	Source	Fisher Low frequency CT Value	Source
		EPC	Exposure Point Concentration	mg/kg	CS, see Table 3-2				CS, see Table 3-3				CS, see Table 3-3				CS, see Table 3-3				CS, see Table 3-3				CS, see Table 3-3				CS, see Table 3-3			
General and Chemical-Specific Exposure Parameters		BW	Body weight	kg	70	a	70	a	70	a	70	a	70	a	70	a	15	b	15	b	70	a	70	a	70	a	70	a	70	a	70	a
		EF	Exposure frequency	days/year	50	c	44	d	365	e	183	f	94	g	38	h	94	g	38	h	260	i	104	j	156	k	52	l	104	j	26	m
		ED	Exposure duration	years	25	n	9	n	2	o	1	o	30	p	9	p	6	q	6	q	70	r	30	s	30	p	9	p	30	p	9	p
		ATc	Averaging time, cancer	days	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a
		ATnc	Averaging time, noncancer	days	9,125	a	3,285	a	730	a	365	a	10,950	a	3,285	a	2,190	a	2,190	a	25,550	a	10,950	a	10,950	a	3,285	a	10,950	a	3,285	a
		ABS	Absorption factor	--	CS		CS		CS		CS		CS		CS		CS		CS		CS		CS		CS		CS		CS		CS	
Beach Sediment - Ingestion	EPC x SIR x EF x ED x CF x 1/BW x 1/AT	SIR	Sediment ingestion rate	mg/day	200	t	50	t	200	u	50	v	100	v	50	v	200	w	100	w	100	v	50	v	100	v	50	v	100	v	50	v
		CF	Conversion Factor	kg/mg	1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06	
Beach Sediment - Dermal	EPC x SA x AF x ABS x EV x EF x ED x CF x 1/BW x 1/AT	SA	Skin surface area	cm2	3,300	x	3,300	x	5,700	v	5,700	v	5,700	v	5,700	v	2,800	w	2,800	w	5,700	v	5,700	v	5,700	v	5,700	v	5,700	v	5,700	v
		AF	Adherence factor	mg/cm2-event	0.2	x	0.02	x	0.3	y	0.07	z	0.3	y	0.07	z	3.3	aa	0.2	ab	0.3	y	0.07	z	0.3	y	0.07	z	0.3	y	0.07	z
		EV	Event Frequency	events/day	1		1		1		1		1		1		1		1		1		1		1		1		1		1	
		CF	Conversion Factor	kg/mg	1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06	

Notes:

(a) Recommended value (EPA 1989).
(b) Recommended value for children (EPA 1991a).
(c) BPJ. Equivalent to 1 day /wk with direct sediment contact during 250 days/yr at facility, which is recommended for occupational exposure (EPA 1991a).
(d) BPJ. Equivalent to 1 day /wk with direct sediment contact during 219 days/yr at facility, which is recommended for occupational exposure (EPA 1991a).
(e) BPJ. Equivalent to every day during the entire year.
(f) BPJ. Equivalent to every day for half the year.
(g) BPJ. 5 days per week during summer (13 weeks), 1 day per week during spring/fall (26 weeks), 1 day per month during winter (3 months).
(h) BPJ. 2 days per week during summer (13 weeks), 2 days per month during spring/fall (6 months).
(i) Required by Region 10. 5 days per week for entire year.
(j) Required by Region 10. 2 days per week for entire year.
(k) Required by Region 10. 3 days per week for entire year.
(l) Required by Region 10. 1 day per week for entire year.
(m) Required by Region 10. 1 day every other week for entire year.
(n) Recommended value for occupational exposures (EPA 1991a).
(o) BPJ.
(p) Recomennded value for residential occupancy (EPA 1997).
(q) Recommended value for children (EPA 1991a).
(r) Conventional lifetime (EPA 1989).
(s) 95th percentile for time at one residence (same as recommended RME for resiential adults) (EPA 1997).
(t) Recommended value for occupational exposures (EPA 2000a).
(u) Required by EPA Region 10.
(v) Recommended value for residential adult exposures (EPA 2000a).
(w) Recommended value for residential child exposures (EPA 2000a).
(x) Recommended value for adult industrial scenario (EPA 2004).
(y) Value for residential adults as gardeners (EPA 2004).
(z) Value for residential adults as gardeners (same as recommended RME for residential adults) (EPA 2004).
(aa) Value for children playing in wet soil (EPA 2004).
(ab) Value for children playing in wet soil (same as recommended RME for residential children) (EPA 2004).

Abbreviations:

-- = Not applicable.
BPJ = Best Professional Judgement.
cm2 = squared centimeter.
CS = Chemical-specific value.
CT = Central tendency exposure.
kg = kilogram.
mg = milligram.
RME = Reasonable maximum exposure.

TABLE 3-27.
Values for Daily Intake Calculations
In-water Sediment Exposures

Exposure Route	Daily Intake Equation (mg/kg-day)	Parameter Code	Parameter Definition	Units	In-water Worker RME Value	Source	In-water Worker CT Value	Source	Tribal Fisher RME Value	Source	Tribal Fisher CT Value	Source	Fisher High frequency RME Value	Source	Fisher High frequency CT Value	Source	Fisher Low frequency RME Value	Source	Fisher Low frequency CT Value	Source	Diver in Wet Suit RME Value	Source	Diver in Wet Suit CT Value	Source	Diver in Dry Suit RME Value	Source
General and Chemical-Specific Exposure Parameters		EPC	Exposure Point Concentration	mg/kg	CS, see Table 3-4				CS, see Table 3-4				CS, see Table 3-4				CS, see Table 3-4				CS, see Table 3-4				CS, see Table 3-4	
		BW	Body weight	kg	70	a	70	a	70	a	70	a	70	a	70	a	70	a	70	a	70	a	70	a	70	a
		EF	Exposure frequency	days/year	10	b	10	b	260	c	104	d	156	e	52	f	104	d	26	g	5	h	2	h	5	h
		ED	Exposure duration	years	10	i	4	j	70	k	30	l	30	m	9	m	30	m	9	m	25	h	9	h	25	h
		ATc	Averaging time, cancer	days	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25550	a	25,550	a	25,550	a
		ATnc	Averaging time, noncancer	days	3,650	a	1,460	a	25,550	a	10,950	a	10,950	a	3,285	a	10,950	a	3,285	a	9,125	a	3,285	a	9,125	a
		ABS	Absorption factor	--	CS		CS		CS		CS		CS		CS		CS		CS		CS		CS		CS	
		SF	Sediment contact frequency	percent	--		--		25%	p	25%	p	25%	p	25%	p	25%	p	25%	p	--		--		--	
Ingestion	EPC x SIR x EF x ED x CF x SF x 1/BW x 1/AT	SIR	Sediment ingestion rate	mg/day	200	n	50	n	50	o	25	o	50	o	25	o	50	o	25	o	50	o	25	o	50	o
		CF	Conversion Factor	kg/mg	1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06	
Dermal Contact	EPC x SA x AF x ABS x EV x EF x ED x SF x CF x 1/BW x 1/AT	SA	Skin surface area	cm2	3,300	q	3,300	q	1,980	r	1,980	r	1,980	r	1,980	r	1,980	r	1,980	r	18,150	h	18,150	h	2,510	h
		AF	Adherence factor	mg/cm2-event	0.2	q	0.02	q	0.3	s	0.07	t	0.3	s	0.07	t	0.3	s	0.07	t	0.3	h	0.07	h	0.3	h
		EV	Event frequency	events/day	1		1		1		1		1		1		1		1		1		1		1	
		CF	Conversion Factor	kg/mg	1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06		1.E-06	

Notes:

(a) Recommended value (EPA 1989).
(b) From interviews with workers at Terminal 4. Frequency for repair/removal of fender piles or maintenance dredging activities.
(c) Required by Region 10. 5 days per week for entire year.
(d) Required by Region 10. 2 days per week for entire year.
(e) Required by Region 10. 3 days per week for entire year.
(f) Required by Region 10. 1 day per week for entire year.
(g) Required by Region 10. 1 day every other week for entire year.
(h) Required by Region 10.
(i) Assumes frequency of every 2-3 years over an employment duration of 25 years.
(j) Assumes frequency of every 2-3 years over an employment duration of 9 years.
(k) Conventional lifetime (EPA 1989).
(l) 95th percentile for time at one residence (same as recommended RME for residential adults (EPA 1997)).
(m) Recommended value for residential occupancy (EPA 1997).
(n) Recommended value for occupational exposures (EPA 2000a).
(o) Recommended by EPA Region 10. Assumed to be 50% of soil ingestion.
(p) Represents the percent of time spent fishing in a single area within the Study Area. Recommended by EPA Region 10.
(q) Recommended value for adult industrial scenario (EPA 2004).
(r) Average surface area for hands and forearms of men (EPA 1997).
(s) Value for residential adults as gardeners (EPA 2004).
(t) Value for residential adults as gardeners (same as recommended RME for residential adults (EPA 2004)).
CT exposure parameters are not listed for diver in dry suit, as required by EPA Region 10.

Abbreviations:

-- = Not applicable.
cm2 = squared centimeter.
CS = Chemical-specific value.
CT = Central tendency exposure.
kg = kilogram.
mg = milligram.
RME = Reasonable maximum exposure.

TABLE 3-28
Values for Daily Intake Calculations
Surface Water and Groundwater Seep Exposures

Exposure Route	Daily Intake Equation (mg/kg-day)	Parameter Code	Parameter Definition	Units	Transient RME Value	Src	Transient CT Value	Src	Adult Recreational Beach User RME Value	Src	Adult Recreational Beach User CT Value	Src	Child Recreational Beach User RME Value	Src	Child Recreational Beach User CT Value	Src	Diver in Wet Suit RME Value	Src	Diver in Wet Suit CT Value	Src	Diver in Dry Suit RME Value	Src
General and Chemical-Specific Exposure Parameters		EPC	Exposure Point Concentration	mg/l	CS, see Table 3-6 and 3-10				CS, see Table 3-7				CS, see Table 3-7				CS, see Table 3-8				CS, see Table 3-8	
		BW	Body weight	kg	70	a	70	a	70	a	70	a	15	b	15	b	70	a	70	a	70	a
		ED	Exposure duration	years	2	c	1	c	30	d	9	d	6	b	6	b	25	e	9	e	25	e
		ATc	Averaging time, cancer	days	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a
		ATnc	Averaging time, noncancer	days	730	a	365	a	10,950	a	3,285	a	2,190	a	2,190	a	9,125	a	3,285	a	9,125	a
		DA	Absorbed dose per event	mg/cm2-event	CS		CS		CS		CS		CS		CS		CS		CS		CS	
Surface Water - Ingestion	EPC x WIR x tev x EF x ED x CF x 1/BW x 1/AT	WIR	Water ingestion rate, non-transients	mL/hour	--		--		50	f	50	f	50	f	50	f	50	f	50	f	50	f
		WIRt	Water ingestion rate - transients	L/day	2	g	1.4	g	--		--		--		--		--		--		--	
		EF	Exposure frequency, non-transients	events/yr	--		--		26	h	13	i	65	j	26	h	5	e	2	e	5	e
		EFt	Exposure frequency-transients	days/yr	365	k	183	l	--		--		--		--		--		--		--	
		t_{ev}	Event duration	hr/event	--		--		1	c	0.5	c	1	c	0.5	c	4	e	2	e	4	e
		CF	Conversion Factor	L/mL	--		--		1.00E-03		1.00E-03		1.00E-03		1.00E-03		1.E-03		1.E-03		1.E-03	
Surface Water - Dermal	DA x SA x EF x ED x 1/BW x 1/AT	t_{ev}	Event duration	hr/event	0.25	m	0.16	n	1	c	0.5	c	1	c	0.5	c	4	e	2	e	4	e
		EF	Exposure frequency	events/yr	104	o	52	p	26	h	13	i	65	j	26	h	5	e	2	e	5	e
		SA	Skin surface area	cm2	18,000	q	18,000	q	18,000	q	18,000	q	6,600	r	6,600	r	18,150	e	18,150	e	2,510	e
Groundwater Seep - Ingestion	EPC x WIR x tev x EF x ED x CF x 1/BW x 1/AT	WIR	Water ingestion rate	mL/hour	50	f	50	f														
		t_{ev}	Event duration	hr/event	0.08	s	0.02	t														
		EF	Exposure frequency	events/yr	26	h	26	h			--				--				--		--	
		CF	Conversion Factor	L/mL	1.00E-03		1.00E-03															
Groundwater Seep - Dermal	DA x SA x EF x ED x 1/BW x 1/AT	t_{ev}	Event duration	hr/event	0.08	s	0.02	t														
		EF	Exposure frequency	events/yr	26	h	26	h			--				--				--		--	
		SA	Skin surface area	cm2	5,700	u	5,700	u														

Notes:

(a) Recommended value (EPA 1989)
(b) Recommended value for children (EPA 1991a).
(c) BPJ.
(d) Recommended value for residential occupancy (EPA 1997)
(e) Required by Region 10.
(f) Recommended value for ingestion while swimming (EPA 1989).
(g) Recommended for residential ingestion of drinking water (EPA 1989).
(h) BPJ. 2 days per week during summer (13 weeks).
(i) BPJ. 1 day per week during summer (13 weeks).
(j) BPJ. 5 days per week during summer (13 weeks).
(k) BPJ. Equivalent to every day during the entire year
(l) BPJ. Equivalent to every day for half the year
(m) BPJ. Bathing in river; equivalent to 15 minutes per bathing event (same as the CT value for residential showering/bathing (EPA 2004b))
(n) BPJ. Bathing in river; equivalent to 9 minutes per bathing event
(o) BPJ. Assumes 2 days per week during entire year
(p) BPJ. Assumes 2 days per week during half the year
(q) Recommended for adults while showering/bathing, and swimming (EPA 2004).
(r) Recommended value for children while swimming (EPA 2004).
(s) BPJ. 5 minutes
(t) BPJ. 1 minute.
(u) Recommended for residential adults (EPA 2004).

Abbreviations:

-- = Not applicable.
BPJ = Best Professional Judgement.
cm^2 = squared centimeter.
CS = Chemical-specific value.
CT = Central tendency exposure.
DA = DAw x EPC, where DAw = absorbed dose per event in l/cm^2-ev. DAw calculations are shown in Table 3-32.
hr = hour.
kg = kilogram.
L = liter.
mg = milligram.
mL = milliliter.
RME = Reasonable maximum exposure.
yr = year.

TABLE 3-29
Values for Daily Intake Calculations
Tissue Exposures

Exposure Route	Daily Intake Equation (mg/kg-day)	Parameter Code	Parameter Definition	Units	Tribal Fisher Adult Value	Source	Tribal Fisher Child Value	Source	Fisher, Adult High Value	Source	Fisher, Adult Higher Value	Source	Fisher, Adult Highest Value	Source	Fisher, Child High Value	Source	Fisher, Child Higher Value	Source	Fisher, Child Highest Value	Source
General and Chemical-Specific Exposure Parameters		EPC	Exposure Point Concentration	mg/kg	CS, see Tables 3-12, 3-14, 3-16, 3-18 to 3-21		CS, see Tables 3-12, 3-14, 3-16, 3-18 to 3-21		CS, see Tables 3-11 to 3-18, 3-22 to 3-25						CS, see Tables 3-11 to 3-18					
		BW	Body weight	kg	70	a	15	b	70	a	70	a	70	a	15	b	15	b	15	b
		EF	Exposure frequency	days/year	365	c	365	c	365	c	365	c	365	c	365	c	365	c	365	c
		ED	Exposure duration	years	70	d	6	b	30	e	30	e	30	e	6	b	6	b	6	b
		ATc	Averaging time, cancer	days	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a	25,550	a
		ATnc	Averaging time, noncancer	days	25,550	a	2,190	a	10,950	a	10,950	a	10,950	a	2,190	a	2,190	a	2,190	a
		CF	Conversion Factor	kg/g	1.00E-03		1.00E-03		1.00E-03		1.00E-03		1.00E-03		1.00E-03		1.00E-03		1.00E-03	
Fish Tissue - Ingestion (single species diet):		IR	Ingestion rate, single species diet	g/day	--		--		17.5	h	73	g	142	f	7	i	31	i	60	i
Fish Tissue - Ingestion (multi-species diet):		IRbb	Ingestion rate of brownbullhead, multi-species diet	g/day	21.7	j	9.1	k	4.4	l	18.3	l	35.5	l	1.8	m	7.8	m	15	m
[(EPCbb*IRbb)+ (EPCbc*IRbc)+ (EPCcp*IRcp)+		IRbc	Ingestion rate of black crappie, multi-species diet	g/day	21.7	j	9.1	k	4.4	l	18.3	l	35.5	l	1.8	m	7.8	m	15	m
(EPCsmb*IRsmb)]+ (EPCsa*IRsa)+ (EPCla*IRla)+		IRcp	Ingestion rate of carp, multi-species diet	g/day	21.7	j	9.1	k	4.4	l	18.3	l	35.5	l	1.8	m	7.8	m	15	m
(EPCst*IRst)] x EF x ED x CF x 1/BW x 1/AT		IRsmb	Ingestion rate of smallmouth bass, multi-species diet	g/day	21.7	j	9.1	k	4.4	l	18.3	l	35.5	l	1.8	m	7.8	m	15	m
		IRsa	Ingestion rate of salmon, Tribal multi-species diet	g/day	67	n	27.9	o	--		--		--		--		--		--	
		IRla	Ingestion rate of lamprey, Tribal multi-species diet	g/day	12.3	n	5.1	o	--		--		--		--		--		--	
		IRst	Ingestion rate of sturgeon, Tribal multi-species diet	g/day	8.6	n	3.6	o	--		--		--		--		--		--	
Shellfish - Ingestion[p]:		IRshell	Ingestion rate of crayfish or clam	g/day	--		--		3.3	r	--		18	q	--		--		--	

Notes:

(a) Recommended value (EPA 1989)
(b) Recommended value for children (EPA 1991a).
(c) Basis of ingestion rates.
(d) Conventional lifetime (EPA 1989).
(e) Recommended value for residential occupancy (EPA 1997)
(f) 99th percentile (EPA 2002b).
(g) 95% UCL for ingestion of 75% of total fish (Adolfson 1996).
(h) 90th percentile (EPA 2002b)
(i) Ajusted from the adult ingestion rate using a factor of 0.42 (ratio of adult to child ingestion from CRITFC 1994).
(j) Ingestion rate for species that are not salmon, lamprey, or sturgeon, 86.9 g/day, divided by 4.
(k) Same dietary percentages as adult Tribal fisher but with total ingestion rate of 73 g/day.
(l) Adult Nontribal ingestion rate for single species divided by 4.
(m) Child Nontribal ingestion rate for single species divided by 4.
(n) CRITFC 1994.
(o) Same dietary percentages as adult Tribal fisher but with total ingestion rate of 73 g/day.
(p) Shellfish intake parameters are the same for both the crayfish and clam ingestion scenarios.
(q) 95th percentile (EPA 2002b).
(r) 50th percentile (EPA 2002b)

Abbreviations:

-- = Not applicable.
cm^2 = squared centimeter.
CS = Chemical-specific value.
g = gram.
kg = kilogram.
mg = milligram.

TABLE 3-30
Values for Daily Intake Calculations
Hypothetical Domestic Water Exposures

Exposure Route	Daily Intake Equation (mg/kg-day)	Parameter Code	Parameter Definition	Units	Adult Resident				Child Resident			
					RME Value	Source	CT Value	Source	RME Value	Source	CT Value	Source
General and Chemical-Specific Exposure Parameters		EPC	Exposure Point Concentration	mg/l	CS, see Table 3-9				CS, see Table 3-9			
		BW	Body weight	kg	70	a	70	a	15	b	15	b
		EF	Exposure frequency	days/yr	350	c	350	c	350	c	350	c
		ED	Exposure duration	years	30	d	9	e	6	b	6	b
		ATc	Averaging time, cancer	days	25,550	a	25,550	a	25,550	a	25,550	a
		ATnc	Averaging time, noncancer	days	9,125	a	3,285	a	2,190	a	2,190	a
Surface Water - Hypothetical Ingestion	EPC x WIR x EF x ED x 1/BW x 1/AT	WIR	Water ingestion rate	L/day	2	f	1.4	f	1.5	f	0.9	f
Surface Water - Hypothetical Dermal Contact	DA x SA x EF x ED x EV x 1/BW x 1/AT	t_{ev}	Event duration	hr/ev	0.58	g	0.25	g	1	h	0.33	h
		SA	Skin surface area	cm2	18,000	g	18,000	g	6,600	h	6,600	h
		EV	Event frequency	event/day	1	i	1	i	1	i	1	i
		DA^j	Absorbed dose per event	mg/cm2-ev	CS		CS		CS		CS	

Notes:

(a) Recommended value (EPA 1989)
(b) Recommended value for children (EPA 1991a).
(c) EPA 1991b
(d) National upper-bound time (90th percentile) at one residence (EPA 1989).
(e) National median time (50th percentile) at one residence (EPA 1989).
(f) Recommended for residential ingestion of drinking water (EPA 1989).
(g) Recommended for adults while showering/bathing (EPA 2004).
(h) Recommended value for children while showering/bathing (EPA 2004).
(i) BPJ.
(j) DA = dermal absorbed dose for water (DAw, l/cm2-ev) multiplied by the EPC (mg/l). DAw calculations are shown in Table 3-33.

Abbreviations:

-- = Not applicable.
BPJ = Best Professional Judgement.
cm^2 = squared centimeter.
CS = Chemical-specific value.
CT = Central tendency exposure.
ev = event.
hr = hour.
kg = kilogram.
L = liter.
mg = milligram.
mL = milliliter.
RME = Reasonable maximum exposure.
yr = year.

Table 3-31
Chemical-Specific Dermal Absorption Factors for Sediment Contact

Chemical	Absorption Factor (ABS)
Arsenic	0.03
Cadmium	0.001
Chlordane	0.04
2,4-Dichlorophenoxyacetic acid	0.05
DDT	0.03
TCDD and other dioxins	0.03
if soil organic content is > 10%	0.001
Lindane	0.04
Benzo(a)pyrene and other PAHs	0.13
Aroclors 1254/1242 and other PCBs	0.14
Pentachlorophenol	0.25
Semivolatile organic compounds	0.1

Source: EPA 2004

TABLE 3-32
Chemical-Specific Parameters for Dermal Exposure to Surface Water and Groundwater Seeps

Chemical of Potential Concern	Kp (cm/hr)	B (unitless)	FA (unitless)	τ (hr/event)	t* (hr)	Adult Beach User, RME		Child Beach User, RME		Transient, RME		Diver[a], RME		Adult Beach User, CT		Child Beach User, CT		Transient, CT		Diver[a], CT	
						Tevent - (hr/event)	DAw[c] - (l/cm^2-event)	Tevent - (hr/event)	DAw - (l/cm^2-event)	Tevent - (hr/event)	DAw - (l/cm^2-event)	Tevent - (hr/event)	DAw - (l/cm^2-event)	Tevent - (hr/event)	DAw - (l/cm^2-event)	Tevent - (hr/event)	DAw - (l/cm^2-event)	Tevent - (hr/event)	DAw - (l/cm^2-event)	Tevent - (hr/event)	DAw - (l/cm^2-event)
Surface Water[b]																					
Metals																					
Arsenic	1.00E-03	--	--	--	--	1	1.0E-06	1	1.0E-06	0.25	2.5E-07	4	4.0E-06	0.5	5.0E-07	0.5	5.0E-07	0.16	1.6E-07	2	2.0E-06
Polynuclear Aromatic Hydrocarbons																					
Benzo(a)anthracene	4.74E-01	2.8	1.0	2.0	8.5	--	--	--	--	--	--	4	3.7E-03	--	--	--	--	--	--	2	2.6E-03
Benzo(a)pyrene	7.02E-01	4.3	1.0	2.7	11.7	--	--	--	--	--	--	4	6.4E-03	--	--	--	--	--	--	2	4.5E-03
Benzo(b)fluoranthene	7.02E-01	4.3	1.0	2.8	12.0	--	--	--	--	--	--	4	6.5E-03	--	--	--	--	--	--	2	4.6E-03
Indeno(1,2,3-cd)pyrene	1.00E+00	6.7	0.6	3.8	16.8	--	--	--	--	--	--	4	6.4E-03	--	--	--	--	--	--	2	4.6E-03
Dibenzo(a,h)anthracene	1.51E+00	9.7	0.6	3.9	17.6	--	--	--	--	--	--	4	9.9E-03	--	--	--	--	--	--	2	7.0E-03
Naphthalene	4.66E-02	0.2	1.0	0.6	1.3	--	--	--	--	--	--	4	2.2E-04	--	--	--	--	--	--	2	1.4E-04
Pesticides																					
Aldrin	1.4E-03	0.0	1.0	11.9	28.5	--	--	--	--	--	--	4	2.7E-05	--	--	--	--	--	--	2	1.9E-05
Herbicides																					
MCPP	1.16E-02	0.1	1.0	1.7	4.0	1	4.1E-05	1	4.1E-05	0.25	2.1E-05	4	8.3E-05	0.5	2.9E-05	0.5	2.9E-05	0.16	1.7E-05	2	5.9E-05
Conventionals																					
Perchlorate	6.01E-08	0.0	1.0	0.4	0.9	--	--	--	--	--	--	4	2.9E-10	--	--	--	--	--	--	2	1.7E-10
Seep Water[b]																					
Metals																					
Arsenic	1.00E-03	--	--	--	--					0.08	8.0E-08							0.02	2.0E-08		
Boron	1.00E-03	--	--	--	--					0.08	8.0E-08							0.02	2.0E-08		
Iron	1.00E-03	--	--	--	--	Not a receptor population for groundwater seep exposure		Not a receptor population for groundwater seep exposure		0.08	8.0E-08	Not a receptor population for groundwater seep exposure		Not a receptor population for groundwater seep exposure		Not a receptor population for groundwater seep exposure		0.02	2.0E-08	Not a receptor population for groundwater seep exposure	
Manganese	1.00E-03	--	--	--	--					0.08	8.0E-08							0.02	2.0E-08		
Molybdenum	1.00E-03	--	--	--	--					0.08	8.0E-08							0.02	2.0E-08		
Semi-Volatile Organic Compounds																					
1,4-Dichlorobenzene	4.20E-02	0.2	1.0	0.7	1.7					0.08	2.8E-05							0.02	1.4E-05		
Phenols																					
2,4-Dichlorophenol	2.10E-02	0.1	1.0	0.9	2.1					0.08	1.5E-05							0.02	7.7E-06		
4-Nitrophenol	4.80E-03	0.0	1.0	0.6	1.5					0.08	3.0E-06							0.02	1.5E-06		
Pesticides																					
Aldrin	1.40E-03	0.0	1.0	11.9	28.5					0.08	3.8E-06							0.02	1.9E-06		
Volatile Organic Compounds																					
Chlorobenzene	2.82E-02	0.1	1.0	0.5	1.1					0.08	1.5E-05							0.02	7.4E-06		
Tetrachloroethene	3.28E-02	0.2	1.0	0.9	2.2					0.08	2.4E-05							0.02	1.2E-05		
Trichloroethene	1.15E-02	0.1	1.0	0.6	1.4					0.08	6.9E-06							0.02	3.4E-06		

Notes:

(a) DA_W for both wet suit diver exposure scenario and dry suit diver exposure scenario.
(b) Values for ABSd, Kp, B, τ, and t* from Exhibit 3-3, Exhibit B-3 of EPA RAGS PART E (EPA 2004), or calculated using equations from EPA RAGS PART E (EPA 2004).
(c) DAw calculated as follows (EPA 2004):
For organics, where Tevent ≤ t*: DAw = 2 x FA x Kp x [(6 x τ x Tevent)/π]^0.5 x 10^{-3} l/cm^3
For organics, where Tevent > t*: DAw = FA x Kp x [(Tevent/(1 + B)) + 2 x τ x ((1 + 3B + $3B^2$)/$(1 + B)^2$)] x 10^{-3} l/cm^3
For inorganics: DAw = Kp x Tevent x 10^{-3} l/cm^3

Abbreviations:

-- = Not applicable.
B = Relative contribution of permeability coefficients.
cm = Centimeters.
CT = Central tendency exposure.
EPA = United States Environmental Protection Agency.
FA = Fraction absorbed water.
hr = Hours.
Kp = Dermal permeability constant.
l = Liters.
RAGS = Risk Assessment Guidance for Superfund.
RME = Reasonable maximum exposure.
t* = Time to reach steady state.
Tevent = Event time.
τ = Lag time.

TABLE 3-33
Chemical-Specific Parameters for Dermal Exposure to Surface Water as a Hypothectical Domestic Water Source

Chemical of Potential Concern	Kp (cm/hr)	B (unitless)	FA (unitless)	τ (hr)	t* (hr)	Adult Resident, RME		Child Resident, RME		Adult Resident, CT		Child Resident, CT	
						Tevent - (hr/event)	DAw[(b)] - (l/cm^2-event)	Tevent - (hr/event)	DAw - (l/cm^2-event)	Tevent - (hr/event)	DAw - (l/cm^2-event)	Tevent - (hr/event)	DAw - (l/cm^2-event)
Surface Water[(a)]													
Arsenic	1.00E-03	--	--	--	--	0.58	5.8E-07	1	1.0E-06	0.25	2.5E-07	0.33	3.3E-07
MCPP	1.16E-02	0.1	1.0	1.67	4.01	0.58	3.2E-05	1	4.1E-05	0.25	2.1E-05	0.33	2.4E-05

Notes:
(a) Values for ABSd, Kp, B, τ, and t* from Exhibit 3-3, Exhibit B-3 of EPA RAGS PART E (EPA 2004), or calculated using equations from EPA RAGS PART E (EPA 2004).
(b) DAw calculated as follows (EPA 2004):
For organics, where Tevent ≤ t*: DAw = 2 x FA x Kp x [(6 xτ x Tevent)/π]^0.5 x 10^{-3} l/cm^3
For organics, where Tevent > t*: DAw = FA x Kp x [(Tevent/(1 + B)) + 2 x τ x ((1 + 3B + $3B^2$)/$(1 + B)^2$)] x 10^{-3} l/cm^3
For inorganics: DAw = Kp x Tevent x 10^{-3} l/cm^3

Abbreviations:
-- = Not applicable.
B = Relative contribution of permeability coefficients.
cm = Centimeters.
CT = Central tendency exposure.
EPA = United States Environmental Protection Agency.
FA = Fraction absorbed water.
hr = Hours.
Kp = Dermal permeability constant.
l = Liters.
RAGS = Risk Assessment Guidance for Superfund.
RME = Reasonable maximum exposure.
t* = Time to reach steady state.
Tevent = Event time.
τ = Lag time.